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### **REMARKS**

In view of the following discussion and claim amendments, the Applicants submit that none of the claims now pending in the application are anticipated or obvious under the provisions of 35 U.S.C. § 102 and § 103. Claim 2 is canceled without prejudice. Thus, the Applicants believe that all of these claims are now in allowable form.

#### **I. REJECTION OF CLAIMS 1-6 AND 8-17 UNDER 35 U.S.C. § 102**

##### **A. Claims 1-2, 4-6, 8-9 and 16**

The Examiner has rejected claims 1-2, 4-6, 8-9 and 16 in the Office Action under 35 U.S.C. § 102 as being anticipated by Durig (U.S. Patent No. 6,084,849, issued July 4, 2000, hereinafter referred to as "Durig".) In response, the Applicants herein amend independent claim 1 and respectfully traverse the rejection.

Durig teaches a shape memory alloy (SMA) recording medium, storage devices based thereon, and method for using these storage devices. (Durig teaches that the tip of a local probe is employed to locally heat the SMA layer for either recording, retrieving or erasing information on the SMA. (See Durig, col. 5, ll. 1-31.)

The Examiner's attention is directed to the fact that Durig fails to teach or to suggest the novel concept of a method for chemically fabricating or altering a submicrostructure on an object comprising providing reactants on the local region of the object and selectively heating at least one reactant on the local region, as positively claimed by Applicants' amended independent claim 1. Specifically, Applicants' amended independent claim 1 recites:

1. A method for chemically fabricating or altering a submicrostructure on an object, comprising:
  - providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface;
  - providing at least one reactant on the local region of the object; and
  - selectively heating the at least one reactant on the local regionusing the heat emitting surface of the heating means to facilitate in the

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local region a local chemical reaction for forming or altering a submicrostructure on the local region. (Emphasis Added.)

The Applicants' invention teaches a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region. In an exemplary embodiment, reactants at ambient temperature are supplied to a local region of the object. (See Applicants' specification, para. [0021]. A heating means is provided with a small heat emitting surface that locally increases the temperature of the at least one reactant disposed proximate to the small heat emitting surface of the heating means. (See Applicants' specification, para. [0017]; para. [0025].) The high temperature of the at least one reactant facilitates a local chemical reaction between the at least one reactant that forms the desired microstructure. (See *Id.*)

In contrast, Durig fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region. Durig only teaches that the tip of a local probe is employed to locally heat the SMA layer for either recording, retrieving or erasing information on the SMA. (See Durig, col. 5, ll. 1-31.) The Examiner asserts that the SMA is also the reactant. (See Office Action, Section 4.) However, the Examiner's attention is directed to the fact that the Applicants' invention teaches that the object and the at least one reactant are separate. In other words, a separate reactant is provided on the local region of the object, as positively recited in Applicants' independent claim 1. Consequently, since Durig fails to teach providing at least one reactant on the local region of the object, Durig also fails to teach or to suggest selectively heating the at least one reactant on the local region. Therefore, Durig clearly fails to anticipate Applicants' independent claim 1.

Furthermore, dependent claims 4-6, 8-9 and 16 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for the

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exact same reason set forth above, the Applicants submit that claims 4-6, 8-9 and 16 are also patentable and not anticipated by Durig. As such, the Applicants respectfully request the rejection be withdrawn.

B. Claims 1-2, 4-6, 8-11

The Examiner has rejected claims 1-2, 4-6 and 8-11 in the Office Action under 35 U.S.C. § 102 as being anticipated by Binning, et al. (U.S. Patent No. 6,218,086, issued April 17, 2001, hereinafter referred to as "Binning"). The Applicants respectfully traverse the rejection.

Binning teaches a method of forming ultrasmall structures and apparatus therefore. A tip which is movable relative to the surface of a thin film is used for forming ultrasmall structures in the thin film. The penetration depth of the tip is limited thereby avoiding wear of the tip. (See Binning, Abstract.)

The Examiner's attention is directed to the fact that Binning fails to teach or to suggest the novel concept of a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region, as positively claimed by Applicants' amended independent claim

1. Specifically, Applicants' amended independent claim 1 recites:

1. A method for chemically fabricating or altering a submicrostructure on an object, comprising:
  - providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface;
  - providing at least one reactant on the local region of the object; and
  - selectively heating the at least one reactant on the local regionusing the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. (Emphasis Added.)

The Applicants' invention teaches a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region. In an exemplary embodiment, reactants at ambient temperature are supplied to a local region of the object. (See Applicants'

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specification, para. [0021]. A heating means is provided with a small heat emitting surface that locally increases the temperature of the at least one reactant disposed proximate to the small heat emitting surface of the heating means. (See Applicants' specification, para. [0017]; para. [0025].) The high temperature of the reactants facilitates a local chemical reaction between the at least one reactant that forms the desired microstructure. (See *Id.*)

In contrast, Binning fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region. Binning only teaches a tip which is movable relative to the surface of a thin film is used for forming ultrasmall structures in the thin film. The penetration depth of the tip is limited thereby avoiding wear of the tip. (See Binning, Abstract.) The Examiner asserts that the PMMA is also the reactant. (See Office Action, Section 5.) However, the Examiner's attention is directed to the fact that the Applicants' invention teaches that the object and the at least one reactant are separate. In other words, a separate reactant is provided on the local region of the object, as positively recited in Applicants' independent claim 1. Consequently, since Binning fails to teach providing at least one reactant on the local region of the object, Binning also fails to teach or to suggest selectively heating the at least one reactant on the local region. Therefore, Binning clearly fails to anticipate Applicants' independent claim 1.

Furthermore, dependent claims 4-6 and 8-11 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for the exact same reason set forth above, the Applicants submit that claims 4-6 and 8-11 are also patentable and not anticipated by Binning. As such, the Applicants respectfully request the rejection be withdrawn.

C. Claims 1-2, 4, 6, 8-9 and 12-15

The Examiner has rejected claims 1-2, 4, 6, 8-9 and 12-15 in the Office Action under 35 U.S.C. § 102 as being anticipated by Yu (U.S. Patent No.

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6,291,302, issued September 18, 2001, hereinafter referred to as "Yu"). The Applicants respectfully traverse the rejection.

Yu teaches a selective laser anneal process using a highly reflective aluminum mask. A laser is used to activate dopants in an active region of a field effect transistor. (See Yu, Abstract.)

The Examiner's attention is directed to the fact that Yu fails to teach or to suggest the novel concept of a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means, as positively claimed by Applicants' amended independent claim 1. Specifically, Applicants' amended independent claim 1 recites:

1. A method for chemically fabricating or altering a submicrostructure on an object, comprising:
  - providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface;
  - providing at least one reactant on the local region of the object; and
  - selectively heating the at least one reactant on the local region using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. (Emphasis Added.)

The Applicants' invention teaches a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means. In an exemplary embodiment, reactants at ambient temperature are supplied to a local region of the object. (See Applicants' specification, para. [0021]. A heating means is provided with a small heat emitting surface that locally increases the temperature of the at least one reactant disposed proximate to the small heat emitting surface of the heating means. (See Applicants' specification, para. [0017]; para. [0025].) The high temperature of the at least one reactant facilitates a local chemical

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reaction between the at least one reactant that forms the desired microstructure.  
(See *Id.*)

In contrast, Yu fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means. Yu only teaches using a beam of energy such as a laser is used to activate dopants in an active region of a field effect transistor. (See Yu, Abstract.) In contrast, the Applicants' invention teaches using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. Therefore, Yu clearly fails to anticipate Applicants' independent claim 1.

Furthermore, dependent claims 4, 6, 8-9 and 12-15 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for the exact same reason set forth above, the Applicants submit that claims 4, 6, 8-9 and 12-15 are also patentable and not anticipated by Yu. As such, the Applicants respectfully request the rejection be withdrawn.

D. Claims 1-4, 6 and 8-9

The Examiner has rejected claims 1-4, 6 and 8-9 in the Office Action under 35 U.S.C. § 102 as being anticipated by Jacobson, et al. (U.S. Patent Publication 2004/0033679, published February 19, 2004, hereinafter referred to as "Jacobson"). The Applicants respectfully traverse the rejection.

Jacobson teaches a patterning of nanostructures. In one embodiment, Jacobson teaches using a scanning beam to crack hydrocarbon vapors and then charge the hydrocarbon vapors, thereby attracting charged nanoclusters. (See Jacobson, para. [0073].) In another embodiment, Jacobson teaches using an ion beam to charge nanoclusters. (See Jacobson, para. [0074]-[0075].)

The Examiner's attention is directed to the fact that Jacobson fails to teach or to suggest the novel concept of a method for chemically fabricating or altering

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a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means, as positively claimed by Applicants' amended independent claim 1. Specifically, Applicants' amended independent claim 1 recites:

1. A method for chemically fabricating or altering a submicrostructure on an object, comprising:
  - providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface;
  - providing at least one reactant on the local region of the object; and
  - selectively heating the at least one reactant on the local region using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. (Emphasis Added.)

The Applicants' invention teaches a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means. In an exemplary embodiment reactants at ambient temperature are supplied to a local region of the object. (See Applicants' specification, para. [0021]. A heating means is provided with a small heat emitting surface that locally increases the temperature of the at least one reactant disposed proximate to the small heat emitting surface of the heating means. (See Applicants' specification, para. [0017]; para. [0025].) The high temperature of the at least one reactant facilitates a local chemical reaction between the at least one reactant that forms the desired microstructure. (See *Id.*)

In contrast, Jacobson fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means.

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Jacobson only teaches using beams of energy such as a scanning beam or ion beam to charge hydrocarbons and nanoparticles. (See Jacobson, para. [0073]-[0075].) In contrast, the Applicants' invention teaches using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region.

Therefore, Jacobson clearly fails to anticipate Applicants' independent claim 1.

Furthermore, dependent claims 3-4, 6 and 8-9 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for the exact same reason set forth above, the Applicants submit that claims 3-4, 6 and 8-9 are also patentable and not anticipated by Jacobson. As such, the Applicants respectfully request the rejection be withdrawn.

E. Claims 1-2, 4, 6, 8-9 and 16-17

The Examiner has rejected claims 1-2, 4, 6, 8-9 and 16-17 in the Office Action under 35 U.S.C. § 102 as being anticipated by Field (U.S. Patent Publication 2003/0222965, published December 4, 2003, hereinafter referred to as "Field"). The Applicants respectfully traverse the rejection.

Field teaches a method and materials for entitling compact discs. A curable material is provided on a data surface of the optical recording medium and a laser is used to interact with the curable material to form permanent text and/or images on the optical recording medium. (See Field, para. [0022].)

The Examiner's attention is directed to the fact that Field fails to teach or to suggest the novel concept of a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means, as positively claimed by Applicants' amended independent claim 1. Specifically, Applicants' amended independent claim 1 recites:

1. A method for chemically fabricating or altering a submicrostructure on an object, comprising:



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providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface;

providing at least one reactant on the local region of the object; and selectively heating the at least one reactant on the local region using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. (Emphasis Added.)

The Applicants' invention teaches a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means. In an exemplary embodiment reactants at ambient temperature are supplied to a local region of the object. (See Applicants' specification, para. [0021]. A heating means is provided with a small heat emitting surface that locally increases the temperature of the at least one reactant disposed proximate to the small heat emitting surface of the heating means. (See Applicants' specification, para. [0017]; para. [0025].) The high temperature of the at least one reactant facilitates a local chemical reaction between the at least one reactant that forms the desired microstructure. (See *Id.*)

In contrast, Field fails to teach or to suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing a heating means proximate to a local region of the object, wherein said heating means includes a heat emitting surface and selectively heating at least one reactant on the local region using the heat emitting surface of the heating means. Field only teaches using a beam of energy such as a laser or some other source of narrowly-focused beam of energy. (See Field, para. [0022].) In contrast, the Applicants' invention teaches using the heat emitting surface of the heating means to facilitate in the local region a local chemical reaction for forming or altering a submicrostructure on the local region. Therefore, Field clearly fails to anticipate Applicants' independent claim 1.

Furthermore, dependent claims 4, 6, 8-9 and 16-17 depend, either directly or indirectly, from claim 1 and recite additional limitations. As such, and for the

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exact same reason set forth above, the Applicants submit that claims 4, 6, 8-9 and 16-17 are also patentable and not anticipated by Field. As such, the Applicants respectfully request the rejection be withdrawn.

## **II. REJECTION OF CLAIM 7 UNDER 35 U.S.C. § 103**

The Examiner has rejected claims 7 in the Office Action under 35 U.S.C. § 103 as being unpatentable over Durig in view of Albrecht, et al. (U.S. Patent No. 5,537,372, issued July 16, 1996, hereinafter referred to as "Albrecht"). The Applicants respectfully traverse the rejection.

The teachings of Durig are discussed above. Albrecht teaches a high density data storage system with topographic contact sensor. The storage system further includes a high resolution contact sensor having a cantilever arm and a stylus mounted at one end of the cantilever arm. (See Albrecht, Abstract.)

As discussed above, Durig fails to teach, show or suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region, as positively claimed by Applicants' amended independent claim 1. (See *supra*.) Durig only teaches that the tip of a local probe is employed to locally heat the SMA layer for either recording, retrieving or erasing information on the SMA. (See Durig, col. 5, ll. 1-31.) Consequently, since Durig fails to teach providing at least one reactant on the local region of the object, Durig also fails to teach or to suggest selectively heating the at least one reactant on the local region.

Moreover, Albrecht fails to bridge the substantial gap left by Durig. Albrecht also fails to teach, show or suggest a method for chemically fabricating or altering a submicrostructure on an object comprising providing at least one reactant on the local region of the object and selectively heating the at least one reactant on the local region. Rather, Albrecht, similar to Durig, only teaches a storage system with a high resolution contact sensor. (See Albrecht, Abstract.) Therefore, the combination of Durig and Albrecht, alone or in any permissible

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combination, fail to render obvious Applicants' independent claim 1.

Furthermore, dependent claim 7 depends, either directly or indirectly, from claim 1 and recites additional limitations. As such, and for the exact same reason set forth above, the Applicants submit that claim 7 is also patentable and not made obvious by the teachings of Durig and Albrecht. As such, the Applicants respectfully request the rejection be withdrawn.

### **CONCLUSION**


Thus, the Applicants submit that all of these claims now fully satisfy the requirement of 35 U.S.C. §102 and §103. Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully Submitted,

July 7, 2006

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